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CONVAIR ASTRONAUTICS

CONVAIR ENGINEERING CORPORATION, 10000 AIRWAY DRIVE, VAN NUYS, CALIF. 91411

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FUNCTIONAL CHECKOUT CONCEPT
OF THE "D" SERIES PURGE BOX

(27-29427, 27-29122 & 27-29401)
with approval of:
Hq. SAMSO, L.A., Ca. 90045
Attn: SMSD

AZE-27-013

DEPT. 537-3

ENGINE SYSTEMS DESIGN GROUP

CONVAIR-
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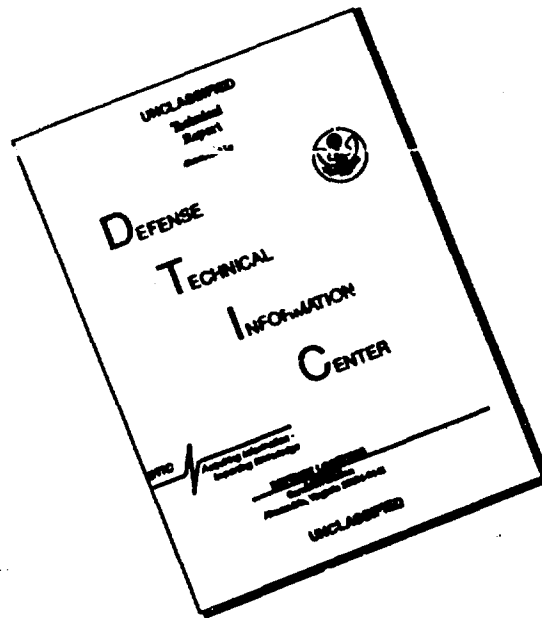
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Functional Checkout Philosophy For The Purge Box

This test will take place when there is no missile on the launcher. This test should be run approximately every 6 months and be so timed as to coincide with missile rotation.

Part of the test will consist of making audible leak checks, therefore this test should be run when there is a minimum of activity at the launcher.

Install CVA 27-29061 (Disconnect Inst'l, - Capping Rise-Off) at the launcher rise-off.

Audibly check the supply line from the MCU to the purge box - no leakage allowed. Audibly check all lines from the purge box to the rise-off panel - no leakage allowed.

In the following paragraphs where purge lines are called out, the first callout will be effective for 65-2 and on, the second callout, in parenthesis, will be effective for 65-1 and 117L.

See that the hand bleed valve on line TOL (T10) and TFL (T9) are closed. Energize solenoid P17. The gauges on lines TOL (T10) and TFL (T9) should read 500 psig. De-energize solenoid P17. Open the hand bleed valves on the two gauges. Allow the pressure to decay and then close the hand bleed valves.

See that the hand bleed valve on line TOD (T8) is closed. Energize solenoid P19. The gauge on line TOD (T8) should read 500 psig. De-energize solenoid P19. Open the hand bleed valve on the gauge. Allow the pressure to decay and then close the hand bleed valve.

See that the hand bleed valves on lines TOF (T11) and TSP (T3) are closed. Energize solenoid P18. The gauges on lines TOF (T11) and TSP (T3) should both read 500 psig. De-energize solenoid P18. Open the hand bleed valves on both gauges. Allow the pressure to decay and then close the hand bleed valves.

Energize solenoid P6. The gauges on lines TOL (T10) and TFL (T9) should read 1000 psig. De-energize solenoid P6. Open the hand bleed valves on the two gauges. Allow the pressure to decay and then close the hand bleed valves.

Open and time the Ground Oxidizer Fill and Drain Valve - maximum time 3 seconds. Close and time the Ground Oxidizer Fill and Drain Valve - maximum time 3 seconds.

Energize solenoid P3. The gauge on line TOF (T11) should read 1000 psig. De-energize solenoid P3. Open the hand bleed valve on the gauge. Allow the pressure to decay and then close the hand bleed valve.

Energize solenoid P4. The gauge on line TOD (T8) should read 1000 psig.

De-energize solenoid P4. Open the hand bleed valve on the gauge.

Allow the pressure to decay and then close the hand bleed valve.

Energize solenoid P1. The gauge on line TSF (T3) should read 1000 psig.

De-energize solenoid P1. Open the hand bleed valve on the gauge.

Allow the pressure to decay and then close the hand bleed valve.

Energize solenoid P5. The gauge on line TOD (T8) should read 1000 psig.

De-energize solenoid P5. Open the hand bleed valve on the gauge.

Allow the pressure to decay and then close the hand bleed valve.

Energize solenoid P8. The gauge on line WVP (X20) should read 1000 psig.

De-energize solenoid P8.

Energize solenoid P14. The gauge on line NPO (X2) should read 1000 psig.

De-energize solenoid P14.

Energize solenoid P15. The gauge on line NPC (X3) should read 1000 psig.

De-energize solenoid P15.

Open and time the Ground Fuel Fill and Drain Valve. Maximum time -
3 seconds.

Close and time the Ground Fuel Fill and Drain Valve. Maximum time -
3 seconds.

Energize solenoid P7. The gauge on line TFL (T9) should read 100 ± 20 psig. De-energize solenoid P7.

Connect a 0 \rightarrow 1000 psig gauge to line NPP (X21). While observing the gauge energize solenoid P20. The pressure should build up slowly to 1000 psig. De-energize solenoid P20. The pressure should decay to 0 psig.

Energize solenoids P21 and P22. The gauge on line MBG (X25) should read 425 psig. De-energize solenoids P21 and P22.

Energize solenoid P23. The gauge on line NGP (X19) should read 425 psig. De-energize solenoid P23.

If any of the above solenoid checks indicate a system malfunction, all plumbing up to the manifold should be leak checked. A leaky solenoid will, in general, leak from the supply to the vent port when de-energized. If this is the case the leakage can be felt by placing a finger over the vent port. Solenoids found defective should be replaced. A bad solenoid, when energized will also leak from the supply to the vent port, generally with much greater flows than when in the de-energized position. Some failures will be attributed to electrical malfunctions. These are generally found by using continuity checks, both internal to the solenoid and the wiring from the controls to the solenoid.

See that the hand bleed valves on lines TOL (T10) and TFL (T9) are closed. Energize solenoid P6. The gauges on lines TOL (T10) and TFL (T9) should read 1000 psig. De-energize solenoid P6. Open the hand bleed valve on line TFL (T9). Observe the gauge on line TOL (T10) for a pressure decay. If the gauge decays more than 10 psig in 5 minutes the first check valve up stream of the gauge in line TOL (T10) is defective. Replace the check valve.

Close the hand bleed valves on lines TOL (T10) and TFL (T9). Energize solenoid P6. The gauges on lines TOL (T10) and TFL (T9) should read 1000 psig. De-energize solenoid P6. Open the hand bleed valve on line TOL (T10). Place a finger over the vent port of solenoid P7. If a pressure build-up is sensed the check valve down stream of solenoid P7 is defective. Replace the check valve. If no pressure build-up is sensed and the gauge on line TFL (T9) decays more than 10 psig in 5 minutes the check valve up stream of the gauge is defective. Replace the check valve.

Close the hand bleed valve on line TOD (T8). Energize solenoid P5. The gauge on line TOD (T8) should read 1000 psig. De-energize solenoid P5. Place a finger over the vent port of solenoids P4 and P5. Leaking indicates the check valve associated with solenoid P4 and P5 is faulty. Replace the check valve that is faulty.

Repeat this same procedure for the check valves associated with solenoids: P1, P3, and P6.

Close the hand bleed valve on line TOF (T11). Energize solenoid P3. Vent and disconnect the Inert Fluid Fill Line MCS (TF). Use soap solution to check for leakage. If there is any leakage replace the check valve in the Inert Fluid Fill Line. (65-1 & 2 only)

Vent and disconnect the Trichloroethylene Flush Supply line, TPS (T7) from the Purge Box. Energize solenoids P3 & P18. Soap check for leakage at the connect point of line TPS (T7). If there is any leakage replace the check valve which prevents flow from line TOF (T11) back into the Trich manifold.

Close the hand bleed valve on line TSF (T3). Energize solenoids P1 and P18. Soap check for leakage at the connect point of line TPS (T7). If there is any leakage replace the check valve which prevents flow from line TSF (T3) back into the Trich manifold.

Close the hand bleed valve on line TOD (T8). Energize solenoids P5 and P19. Soap check for leakage at the connect point of line TPS (T7). If there is any leakage replace the check valve associated with solenoid P19.

Close the hand bleed valves on lines TOL (T10) and TFL (T9). Energize solenoids P6 and P17. Soap check for leakage at the connect point of line TPS (T7). If there is any leakage replace the check valve associated with solenoid P17.

Return the system to its origin. onfiguration.

The purge box at the S.M.A. should be checked once every 12 months.

This procedure should be used noting that the purge box at the S.M.A. does not have a Trich manifold, Fuel and Lox Ground Fill and Drain Valve control or Fuel Fill Line Pressurisation control.

The filter on the nitrogen inlet line (27-02105-1) must be replaced every 18 months.